Sunoco Facility: Marcus Hook
Report Title: Semi-Annual Consent Decree Compliance Report # 12
Reporting Period: 07/01/11 – 12/31/11

Paragraph 114 Reporting and Recordkeeping of Affirmative Relief / Environmental Projects and Emission Data in Section V with Certification

I. Progress Report for Implementation of (section V) Affirmative Relief/Environmental Projects

A. NOx Emissions Reductions from the FCCU

The amended consent decree required the installation of a SNCR at the FCC unit by 1/1/12. The SNCR was installed as required. The FCC unit was shut down in early December and remains idled at this time. If the FCC unit is restarted the SNCR unit will be placed in service.

B. SO2 Emissions Reductions from the FCCU

The amended consent decree had provisions for SO_2 emissions that were applicable in 2011. The total annual SO_2 emissions was limited to 2200 tons. Sunoco applied for and was granted a plan approval changing the SO_2 limit to reflect 2200 tons. Sunoco was compliant with that provision in 2011. The FCC unit was shut down in December of 2011 and is idled at this time. Sunoco will be compliant with the amended consent decree requirements if the FCC unit is restarted.

C. Control of PM Emissions from FCCU

Paragraph 16 – Marcus Hook has been compliant with the 1.0 lbs/1000 lbs of coke burn PM requirement as demonstrated in June 2011 using a method 5 test.

D. Control of CO Emissions from FCCU

Paragraph 19 – Marcus Hook Refinery is compliant with the requirements of this paragraph. There were deviations to the one hour CO standard due to upsets. Deviations are reported separately in the quarterly and semiannual progress reports submitted to PADEP.

E. NSPS Subparts A and J Applicability at FCCU Regenerators

Paragraph 25 – Marcus Hook is compliant with Subparts A & J. There were deviations to the opacity standard. Deviations are reported separately in the quarterly and semiannual progress reports submitted to PADEP.

F. NO_x Emission Reductions from Heaters and Boilers

Paragraph 31 – The final detailed NOx Control Plan was submitted to EPA and the Appropriate Plaintiffs/Intervenors on 06/14/10. Per the June 2009 CD Amendment, the plan has been modified to delete any reduction from the Tulsa refinery

G. SO_2 Emissions Reductions from and NSPS Applicability for Heaters and Boilers

Paragraph 37 – No changes have been made since the last progress report.

I. Sulfur Recovery Plants - NSPS Applicability

Marcus Hook is compliant with Subpart J for Sulfur Plant/Tail gas Units. There were no deviations to the 12-hr SO_2 standard.

J. Hydrocarbon Flaring Devices

Paragraph 48 – Alternative Monitoring Protocols ("AMPs") for the 10 Plant and 12 Plant Flares were submitted to EPA on November 12, 2008 and implemented beginning January 1, 2009. The AMPs were approved by the EPA on May 19, 2009.

The 10 Plant Flare services the Fluid Catalytic Cracking Unit (FCC) and was operated in compliance with the AMP during this reporting period. The FCC unit was idled in early December of 2011. By late December generation of high-sulfur flare gas from the FCC had ceased, the 10 Plant Flare was purged, and the pilots were extinguished. Any future restart and operation of the FCC unit and 10 Plant Flare will be undertaken in compliance with the 10 Plant Flare AMP.

The 12 Plant Flare services a crude unit and two desulfurizing units and was operated in compliance with the AMP during this reporting period. Those units were idled in early December of 2011. The 12 Plant flare remained in operation past the end of this reporting period to complete the 12 Plant shutdown, as some purging and venting of units was still occurring. However, generation of high sulfur flare gas from the crude and desulfurizing units has ceased, and the purge gas is inherently low-sulfur. Sunoco intends to shutdown the 12-3 Flare in the near future. Any future restart and operation of the crude and desulfurizing units and the 12 Plant Flare will be undertaken in compliance with the AMP.

The Alternative Monitoring Protocol for the Main (EC) Flare was submitted on December 10, 2010. The AMP for the Main (EC) flare was implemented on January 1st, 2011. EPA approved the Main Flare AMP on 09/21/11. The Main (EC) Flare was operated in compliance with the AMP during this reporting period. However, as stated above, there have been no high sulfur flare gas streams generated in the refinery since the main process units were shutdown. Therefore, the Main Flare no longer has the potential to receive high sulfur streams. Sunoco expects the Main Flare to remain in service for the Propane – Propylene Splitter Area, gaseous storage areas, and some fuel gas. The streams generated

in these areas are inherently low-sulfur. Any future restart and operation of a unit or unit(s) that may vent high sulfur streams to the Main (EC) Flare will be undertaken in compliance with the AMP.

K. Control of Acid Gas Flaring and Tail Gas Incidents

Paragraphs 52 & 53 –There were no Tail Gas or Acid gas incidents during the period.

L. Control of Hydrocarbon Flaring Incidents

There were no hydrocarbon flaring incidents during the reporting period.

M. Benzene Waste NESHAP Program Enhancements

Paragraphs 65-77

1. **The BWON exempted quantity was calculated to be 8.66 E-02 MG for the third quarter and 7.23 E-02 MG for the fourth quarter of 2011. The 2011 annual BWON exempted quantity, based on EOL sampling, is calculated to be 3.91 E-01 MG based on samples listed in Appendix I.**

N. Leak Detection and Repair Program Enhancements

Paragraphs 78-92

1. **LDAR Monitoring Technician Refresher Training is conducted by Team Inc on a monthly basis.**

2. **No Third party Audits of the program were conducted in 2011.**

O. Incorporation of Consent Decree Requirements into Federally Enforceable Permit(s)

Paragraphs 93-96: The Marcus Hook Refinery is compliant with the requirements of these paragraphs. As required under the recently amended consent decree, Sunoco has submitted applications and received final plans approvals to the relevant permitting agency to cover the installation of SNCR on the Marcus Hook #3 CO Boiler and for the calendar year mass emissions limits for SO_2 (in 2011) and NOx (in 2012).

II. Summary of (section V) Emissions Data

Included herein.

III. Description of Any Problems Anticipated with Meeting (section V) Requirements

N/A

IV. Additional Matters to be Brought to the Attention of EPA and the Appropriate Plaintiff/Intervenor

N/A

Paragraph 112 SUPPLEMENTAL AND COMMUNITY ENVIRONMENTAL PROJECTS (SCEP) AND STATE AND LOCAL ENVIRONMENTALLY BENEFICIAL PROJECTS (SLEBP) in Section VIII with Certification

I. Progress Report for Each SCEP or SLEBP (section VIII)

Paragraph 104: Complete

Paragraph 105: Complete

Paragraph 106: Complete

Paragraph 107: Complete

Paragraph 107A: On 08/19/11, Sunoco requested PADEP to permanently retired 100 tons of VOC emissions reduction credits as required by the second amendment to the consent decree. PADEP officially retired the ERCs VOC on 10/18/11.

Paragraph 107B: On 04/20/11, Sunoco submitted an application to the New Jersey Department of Environmental Protection (NJDEP) requesting the registration of emissions reduction credits resulting from the shutdown of Sunoco Eagle Point refinery. Sunoco will permanently retire the 158 NOx credits required by the consent decree as soon as the registration process is completed by NJDEP.

Paragraph 108: Complete

Paragraph 109: Complete

II. Completed SCEP or SLEBP (section VIII)

A. Detailed Description of Each SCEP or SLEBP Project as Implemented

N/A

B. Brief Description of Any Significant Operating Problems Encountered

N/A

C. Certification That Each Project Has Been Fully Implemented Pursuant to the

Provisions of this Consent Decree

N/A

D. Description of the Environmental and Public Health Benefits Resulting From Implementation of Each Project (including quantification of the benefits and pollutant reductions, where practicable)

N/A

Appendix I

Sunoco Marcus Hook Refinery

2011 Total Benzene Summary

Unit	2011 1Q Exempt Benzene Total	2011 1Q Exempt Benzene Total	2011 2Q Exempt Benzene Total	2011 2Q Exempt Benzene Total	2011 3Q Exempt Benzene Total	2011 3Q Exempt Benzene Total	2011 4Q Exempt Benzene Total	2011 4Q Exempt Benzene Total	*Projected Total for Year*	Annual Total, MG
	lb	Mg	lb	Mg	lb	Mg	lb	Mg	*Mg*	
Spills	0.00E+00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	***0.00E+00***	**0.00E+00**
Waste	3.00E+00	1.36E -03	0.08	3.60E -05	3.16	1.43E -03	16.95	7.69E -03	***1.05E -02***	**1.05E -02**
Dock Pans	1.56E+02	7.08E -02	159.34	7.23E -02	151.67	6.88E -02	106.51	4.83E -02	***2.60E -01***	**2.60E -01**
Exchanger Cleanouts	1.08E+02	4.90 E-02	8.55E+01	**3.88E -02**	**36.0**	**1.63E -02**	**36.0**	**1.63E -02**	***1.20E -01***	***1.20E -01***
Total Quarterly Benzene		**1.21E -01**		**1.11E -01**	**1.91E+02**	**8.66E -02**	**1.59E+02**	**7.23E -02**	***3.91E -01***	
PROJECTED Annual Total Exempt Benzene for the year ***(as of quarter indicated)***[1][2]		**4.84E -01**		**4.64E -01**		**8.66E -02**		**7.23E -02**		***3.91E -01***

Sunoco Facility: Philadelphia
Report Title: Semi-annual Consent Decree Compliance Report # 12
Reporting Period: 07/01/11 – 12/31/11

Paragraph 114 Reporting and Recordkeeping of Affirmative Relief / Environmental Projects and Emission Data in Section V with Certification

I. Progress Report for Implementation of (section V) Affirmative Relief/Environmental Projects

A. NOx Emissions Reductions from the FCCU

Paragraphs 12 – 13: There were no NOx exceedances of the CD limits during the period. As discussed in two previous updates submitted in accordance with the amended CD (via email), Sunoco used Low NOx Combustion Promoter at the 868 FCCU for the first time on April 28, 2011 and the first time the Low NOx Combustion Promoter was added after the Date of Lodging was July 15, 2011.

B. SO2 Emissions Reductions from the FCCU

Paragraphs 14 – 15: The Philadelphia Refinery is compliant with the requirements of these paragraphs. There were no SO_2 exceedances of the CD limits during the period. Sunoco used SO_2 Reducing Catalyst Additives in the 868 FCCU during the reporting period.

C. Control of PM Emissions from FCCU

Paragraph 16 – The Philadelphia Refinery is compliant with the requirements of this paragraph.

D. Control of CO Emissions from FCCU

Paragraph 19 – There were no consent decree CO exceptions noted during the reporting period pursuant to paragraph 19. However, we did exceed the permitted 54 lbs/hour limit on August 24 (55.3 lbs/hour) and exceeded 500 ppm for one hour during startup of the unit after an emergency shutdown on October 29 (671 ppm).

Paragraph 20 – Philadelphia Refinery is compliant with the requirements of this paragraph.

E. NSPS Subparts A and J Applicability at FCCU Regenerators

Paragraphs 24 – 25: There was one Subpart A or J exceptions during the reporting period.

An emergency shutdown and associated startup of the 868 unit on October 29 caused an exceedance of Subpart J limits for one hour during shutdown and 6 hours during startup. Opacity was above 30% for 19 minutes during the shutdown at 1 PM and 9 minutes, 14

minutes, 29 minutes, 9 minutes, 4 minutes and 2 minutes during the hours between 4 PM and 9 PM.

In addition, operating problems for one hour on August 24 caused the opacity to exceed 20% for 5 minutes (one minute was over 30%) which is above the 3 minutes allowed by our permit. On September 10, problems with a soot blower caused one minute to be at or above the permit limit of 60% although the 6 minute average did not exceed the subpart J 30% limit.

F. NO_x Emission Reductions from Heaters and Boilers

Paragraph 31– All work has been completed.

G. SO_2 Emissions Reductions from and NSPS Applicability for Heaters and Boilers

On December, 31, 2010, all refinery heaters and boilers became subject to NSPS J. Sunoco submitted a plan approval application to Philadelphia Air Management Services to incorporate these limits into a permit. A draft of this permit was received in July, 2011 and a final permit was received September 23, 2011.

Paragraphs 36 – 38: In accordance with the Consent Decree Appendix D, all remaining refinery heaters and boilers became subject to NSPS Subpart J. There was one event that caused exceedance of the three hour rolling average H_2S limit at NSPS Subpart J regulated heaters as shown below:

On July 5, a faulty level indicator on the 862 amine regenerator caused a loss of reflux which essentially reduced the removal of H_2S in the amine. This led to an increase in the H_2S level in the fuel gas until the reflux could be re-established. The 3 hour average H_2S in fuel gas was over 162 ppm (175 ppm) for 15 Point Breeze heaters for one hour.

All RICE equipments listed in paragraph 38A of the amended Consent Decree were either permanently removed or replaced with equivalent electrical engine by December 31, 2011.

I. Sulfur Recovery Plants - NSPS Applicability

Paragraphs 40 – 47: The Philadelphia Refinery is compliant with the requirements of these paragraphs.

J. Hydrocarbon Flaring Devices

Paragraphs 48 – 50: The following is a summary of options the Philadelphia Refinery has elected to comply with regarding the CD NSPS requirements for flares.

Philadelphia Flares	Compliance Status
PB North Yard LPG Flare	NSPS. Have an approved AMP. Please note that a request to revise this approved AMP was submitted to USEPA and approved by them in April, 2010.
PB South Yard North Flare	NSPS. Operating and maintain a flare gas recovery system.
PB 867 Acid Gas Flare	NSPS. This is not currently a fuel gas combustion device. The purge and pilot gas is comprised of purchased natural gas. When the purge and pilot gas is converted to refinery fuel gas, that gas will be monitored to be compliant with Subpart J. The flare only receives non-routinely generated gases; process upset gases, fuel gas released as a result of relief valve leakage or gases released due to other emergency malfunctions.
PB 867 SWS Gas Flare	NSPS. This is not currently a fuel gas combustion device. The purge and pilot gas is comprised of purchased natural gas. When the purge and pilot gas is converted to refinery fuel gas, that gas will be monitored to be compliant with Subpart J. The flare only receives non-routinely generated gases, process upset gases, fuel gas released as a result of relief valve leakage or gases released due to other emergency malfunctions.
GP 1231/1232 Flares	NSPS status began12/31/2010. AMP submitted in July, 2010 and approved by EPA in June, 2011.
GP 433 Flare	NSPS status began 12/31/2010. AMP submitted in July, 2010 and approved by EPA in June, 2011.

K. Control of Acid Gas Flaring and Tail Gas Incidents

Paragraphs 51 – 63: Acid gas flaring computational methods have been in place since the DOE. There were no AG flaring events to note for this reporting period.

L. Control of Hydrocarbon Flaring Incidents

Paragraph 64: One Hydrocarbon Flaring Incident occurred during this reporting period, July 5-11, 2011. The Investigation Report for this incident is attached as Appendix I.

M. Benzene Waste NESHAP Program Enhancements

Paragraphs 65-77

1. **Relative to BWON training conducted over this semi-annual period, one employee was trained on how to properly collect benzene waste NESHAP samples.**

2. **The BWON exempted quantity was calculated to be, based on EOL sampling data, 0.03 MG for the third quarter and 0.07 MG for the fourth quarter of 2011. The 2011 annual BWON exempted quantity, based on EOL sampling is 0.27. See Appendix II for EOL sampling results.**

3. **A revised BWON EOL Sampling Plan for the Philadelphia Refinery was submitted on December 30, 2008. This revised sampling plan was approved by the EPA on 01/22/09, which resulted in relocating end-of-line sampling point GP EOL-001 and adding sample point GP EOL-006.**

N. Leak Detection and Repair Program Enhancements

Paragraphs 78 – 92: The Philadelphia Refinery is compliant with the requirements of these paragraphs with the exception of Section 85- First attempt at repairs on valves. On 8/19/2011, a first attempt at repair was not made within one (1) calendar day on two (2) valves with readings greater than 200 ppm of VOC.

No audits were conducted pursuant to Paragraph 80 during the reporting period.

Eight (8) of the eleven (11) corrective actions for audit findings identified in the 2010 LDAR Third Party Compliance Audit have been completed in 2011.

The facility LDAR coordinator changed from Jennifer Eisenmann to Carolyn Ruch during the reporting period. This change became effective 10/18/2011.

Information required under Paragraph 92(c) will be submitted in the first semiannual report of 2012 under 40 CFR 63.654.

O. Incorporation of Consent Decree Requirements into Federally Enforceable Permit(s)

Paragraphs 93 – 96: The Philadelphia Refinery is compliant with the requirements of these paragraphs. Please note that in March, 2011, the Refinery submitted a plan approval application to incorporate NSPS J requirements on all remaining refinery heaters, boilers and flares. A final permit was received from AMS on September 23, 2011.

II. Summary of (section V) Emissions Data

Included herein.

III. Description of Any Problems Anticipated with Meeting (section V) Requirements

None

IV. Additional Matters to be Brought to the Attention of EPA and the Appropriate Plaintiff/Intervenor

None

Paragraph 112 SUPPLEMENTAL AND COMMUNITY ENVIRONMENTAL PROJECTS (SCEP) AND STATE AND LOCAL ENVIRONMENTALLY BENEFICIAL PROJECTS (SLEBP) in Section VIII with Certification

I. Progress Report for Each SCEP or SLEBP (section VIII)

Paragraph 104: All required work was completed during this report period and the SCR unit for the H-400 and H-401 heaters was in service on December 30, 2010. Some minor work post construction punch list work was completed in the first half and some minor touch up painting was completed in the third quarter of 2011.

Paragraph 105: Complete

Paragraph 106: Complete

Paragraph 107: Complete

Paragraph 108: Complete

Paragraph 109: Complete

Paragraph 110: A cost report for the SCR unit for the H-400 and H-401 heaters will be submitted in January 2012.

II. Completed SCEP or SLEBP (section VIII)

A. Detailed Description of Each SCEP or SLEBP Project as Implemented

None

B. Brief Description of Any Significant Operating Problems Encountered

None

C. Certification That Each Project Has Been Fully Implemented Pursuant to the Provisions of this Consent Decree

If applicable, see the certification behind the cover letter.

D. Description of the Environmental and Public Health Benefits Resulting From Implementation of Each Project (including quantification of the benefits and pollutant reductions, where practicable)

N/A

APPENDIX I

Philadelphia Refinery
Hydrocarbon Flaring Incident

Investigation Report for Acid Gas, Sour Water Gas, Tail Gas, or Hydrocarbon Flaring Resulting in ≥ 500 lbs. of SO_2 Released

Date of Report:	January 15, 2012	**Incident Type:** (Check one)	☐ Acid Gas Flaring: ☐ Tail Gas Flaring: ☒ Hydrocarbon Flaring:
Date(s) of Incident:	(Beginning) 7/5/2011 (End) 7/11/2011	1st Flaring start/end time:	(start) 10:53 AM (end) 17:49 PM
		2st Flaring start/end time:	(start) (end)
		3st Flaring start/end time:	(start) (end)
Amount of SO_2 Released:	13.5 Pounds ☐ Tons ☒	**Location at the Philadelphia Refinery:** 868 Fluid Catalytic Cracking Unit	SWS Flare ☐ 1231/2 Flare ☐ AG Flare ☐ SY N Flare ☒ North Flare ☐ 433 Flare ☐

Incident Description:

At 11:00 AM on Wednesday 7/6/11 a water wash was being performed on the 868 Fluid Catalytic Cracking Unit 8CT-201 1st Stage Wet Gas Turbine per procedure 868.814. As the wash was started the 8CT-201 immediately tripped off line due to high thrust movement. The sudden loss of the compressor caused a unit upset which lead to the 8PIC-209 1st stage suction flare valve to open. Aggressive moves were made by way of feed reduction and riser temperature reduction in an effort to minimize flaring. Evaluation was performed on the turbine and it was determined that the outboard thrust bearing failed.

The unit rate was cut back to allow operation of the unit while the damaged compressor was repaired. After initial flaring where some smoke was present for a few hours, the flaring continued without any visible emissions. The compressor was repaired and returned to service on July 11. During this time, the estimated total sulfur dioxide emissions were 26,955 pounds and nitrogen oxides were 3031 pounds. At no time was the flare SO2 permit limit (500 ppm) exceeded or did an SO2, NO or NO2 RQ event occur.

Steps taken to limit duration of flaring or quantity of SO2/Hydrocarbon released (Corrective Actions):

Aggressive moves were made by way of feed reduction and riser temperature reduction in an effort to minimize flaring. The unit rate was held at minimum operating rate to allow operation of the unit while the damaged compressor was repaired.

Root Cause of Incident:

Evaluation was performed on the turbine and it was determined that the outboard thrust bearing failed. The water wash procedure 868.814 was followed but in this incident, must have allowed a higher water flow than the compressor could manage.

Contributing Causes of Incident:

Fouling of turbine side of the compressor led to the need to water wash.

Preventative Actions (Actions to reduce likelihood of Recurrence):

Consider adding a smaller bore condensate valve in parallel to restrict initial condensate volume.

Update procedure 868.814 to reflect changes

Tailgate all 868 Operators on incident causes, prevention & action.

Do Stipulated Penalties Apply? (Acid Gas Flaring Only) YES ☐ NO ☒

If YES explain:

- ☐ **Yes** ☐ **No** **Error resulting from careless operation.**
- ☐ **Yes** ☐ **No** **Failure to follow written procedures.**
- ☐ **Yes** ☐ **No** **Failure of equipment due to failure by Sunoco to operate and maintain equipment in a manner consistent with good engineering practices**
- ☐ **Yes** ☐ **No** **SO_2 rate greater than 20 lbs/hour continuously for 3 hours or more where SUNOCO did not follow PMO plan and took no action to limit duration and/or quantity of SO_2 emissions.**
- ☐ **Yes** ☐ **No** **More than five acid gas flaring incidents in rolling 12 months period.**

If NO explain:

Hydrocarbon Flaring Event

If corrective actions are not completed within 45 days from the end date of the incident, list the projected date for the follow-up report which will show corrective actions and preventive actions:

N/A: ☐ **Completed:** ☒ **Not Completed:** ☐ **Explain:** All planned preventative actions were completed by 12/31/11.

Approval Section		
Title	**Print Name**	**Date**
Operations Superintendent:	John Callahan	January 15, 2012
Environmental Manager:	Charles D. Barksdale Jr.	January 17, 2012
Operations Manager:	Mark O. Brandon	January 17, 2012

APPENDIX II

Philadelphia Refinery

1. CD Paragraph 77(B)(i)(3) Sampling Results Philadelphia Refinery

Sample Point ID	Sample Date	Benzene Conc (ppmw)	Avg 3rd Qtr 2011 Benzene Conc. (ppmw)	Avg 4th Qtr 2011 Benzene Conc. (ppmw)	3rd Qtr 2011 Flow (gal)	4th Qtr 2011 Flow (gal)	3rd Qtr 2011 Benzene Quantity (Megagrams)	4th Qtr 2011 Benzene Quantity (Megagrams)
210 Box Cooler (PB EOL 001)	7/18/11	0.018	0.007		74235000		0.002	0.0008
	8/8/11	0.00099						
	9/12/11	0.00099						
	10/10/11	0.006		0.003		74235000		
	11/7/11	0.00099						
	12/12/11	0.003						
Klondike Effluent (PB EOL 002)	7/18/11	0.01	0.004		10000000		0.0002	0.0002
	8/8/11	0.00099						
	9/12/11	0.00099						
	10/10/11	0.002		0.004		10000000		
	11/7/11	0.00099						
	12/12/11	0.009						
867 Effluent (PB EOL 003)	7/19/11	0.00099	0.003		22625000		0.0003	0.00009
	8/8/11	0.00099						
	9/12/11	0.006						
	10/11/11	0.001		0.001		22625000		
	11/8/11	0.002						
	12/13/11	0.001						
***PB Grit Chamber Effluent (PB EOL 004)**								
*No samples taken this period - not required. Grit chamber samples were only required to be sampled for one quarter and this had already								

occurred in early 2008.

Sample Point ID	Sample Date	Benzene Conc (ppmw)	Avg 3rd Qtr 2011 Benzene Conc. (ppmw)	Avg 4th Qtr 2011 Benzene Conc. (ppmw)	3rd Qtr 2011 Flow (gal)	4th Qtr 2011 Flow (gal)	3rd Qtr 2011 Benzene Quantity (Megagrams)	4th Qtr 2011 Benzene Quantity (Megagrams)
1232 4th and M (GP EOL 001)	7/18/11	0.097	0.06		71500000		0.02	0.03
	8/8/11	0.067						
	9/12/11	0.015						
	10/11/11	0.013		0.1		71500000		
	11/7/11	0.22						
	12/12/11	0.074						
231 F Box Discharge (GP EOL 002)	7/19/11	1.0	0.5		3450000		0.007	0.005
	8/8/11	0.19						
	9/12/11	0.32						
	10/11/11	0.034		0.42		3450000		
	11/8/11	0.96						
	12/13/11	0.26						
231 Groundwater (GP EOL 003)	7/11	*No sample	*0		*0		*0	*0
	8/11	*No sample						
	9/11	*No sample						
	10/11	*No sample		*0		*0		
	11/11	*No sample						
	12/11	*No sample						
* Groundwater system not operational the entire six month period.								
#3 Separator Effluent (GP EOL 004)	7/18/11	0.00099	0.00099		3150000		0.00001	0.00001
	8/8/11	0.00099						
	9/12/11	0.00099						
	10/11/11	0.00099						

	11/7/11	0.00099		0.001		3150000		
	12/12/11	0.002						

Sample Point ID	Sample Date	Benzene Conc (ppmw)	Avg 3rd Qtr 2011 Benzene Conc. (ppmw)	Avg 4th Qtr 2011 Benzene Conc. (ppmw)	3rd Qtr 2011 Flow (gal)	4th Qtr 2011 Flow (gal)	3rd Qtr 2011 Benzene Quantity (Megagrams)	4th Qtr 2011 Benzene Quantity (Megagrams)
8 Separator Effluent (GP EOL 005)	7/18/11	0.00099	0.02		8300000		0.0006	0.0009
	8/8/11	0.02						
	9/12/11	0.04						
	10/11/11	0.00099		0.03		8300000		
	11/7/11	0.00099						
	12/12/11	0.077						
15 Pumphouse (PB Non-EOL 001)	7/18/11	0.009	0.005		15000		0.000003	0.0000001
	8/8/11	0.005						
	9/12/11	0.00099						
	10/10/11	0.002		0.002		15000		
	11/7/11	0.00099						
	12/12/11	0.002						
1232 Sewer M Street (GP EOL 006)	7/18/11	0.00099	0.00099		4700000		0.00002	0.03
	8/8/11	0.00099						
	9/12/11	0.00099						
	10/11/11	0.00099		1.7		4700000		
	11/8/11	*50.0 (P) 0.008 (W)						
	12/13/11	0.05						
* For the November 2011 sampling event, 10% product (P) and 90% water (W) was observed. For all other months during this semi-annual period, 100% water (no product) was observed.								
V-4 Hydrocarbon Separator								

Condensate Wash (GP Non-EOL 001)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
No waste was generated from this Non-EOL point during the semi-annual period.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
V-603 Debutanizer Receiver Condensate Wash (GP Non-EOL 002)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
No waste was generated from this Non-EOL point during the semi-annual period.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

3rd Qtr 2011 EOL Sampling TAB = 0.03 Megagrams
4th Qtr 2011 EOL Sampling TAB = 0.07 Megagrams

Annual 2011 EOL sampling TAB = 0.27 Megagrams

Notes:

1. *Benzene concentrations listed as 0.00099 ppm were reported by the laboratory as < 0.001 ppm which is the detection limit.*

2. *Average quarterly benzene concentrations are simply the arithmetic mean of the individual laboratory results for the quarter.*

3. Sample calculation of 3rd Qtr Benzene Quantity for GP EOL 002:

3rd Qtr avg benzene conc. = 0.5 ppm
3rd Qtr flow = 3,450,000 gallons

So: $\frac{0.5 \text{ ppm benzene} \times 3{,}450{,}000 \text{ gallons} \times 8.34 \text{ lbs/gallon}}{2204.6 \text{ lbs/megagram} \times 1{,}000{,}000 \text{ parts per million}} = 0.007$ Megagrams